

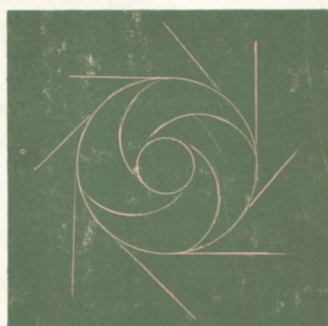
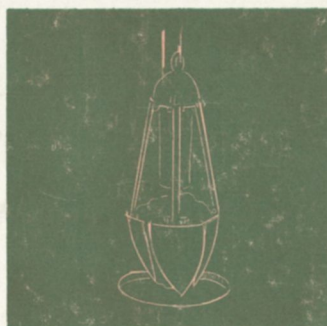
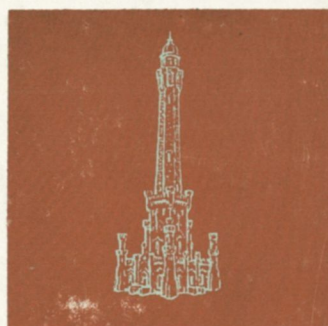
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JUN 2 1 1966



DEPARTMENT OF  
**WATER & SEWERS**



**CITY OF CHICAGO**  
Richard J. Daley, Mayor



# THE CHICAGO CITY COUNCIL

1965



HON. RICHARD J. DALEY

Mayor

JAMES C. MURRAY

President Pro Tem

JOHN C. MARCIN

City Clerk

MORTON GORDON

Deputy City Clerk

## ALDERMEN

### Ward

1. Donald W. Parrillo
2. William H. Harvey
3. Ralph H. Metcalfe
4. Claude W. B. Holman
5. Leon M. Despres
6. Robert H. Miller
7. Nicholas J. Bohling
8. James A. Condon
9. Dominic J. Lupo
10. John J. Buchanan
11. Matthew J. Danaher
12. Arthur V. Zelezinski
13. David W. Healy

### Ward

14. Joseph P. Burke
15. Joseph J. Kraska
16. Paul M. Sheridan (a)
17. Charles Chew, Jr.
18. James C. Murray
19. Thomas F. Fitzpatrick
20. Kenneth E. Campbell
21. Samuel Yaksic
22. Otto F. Janousek
23. George J. Tourek
24. George W. Collins
25. Vito Marzullo

### Ward

26. Stanley M. Zydlo
27. Harry L. Sain
28. Angelo C. Provenzano
29. Thomas F. Burke
30. Edwin H. McMahon
31. Thomas E. Keane
32. Robert J. Sulski
33. Robert Brandt
34. Rex Sande
35. Casimir C. Laskowski

### Ward

38. William J. Cullerton
39. Anthony C. Laurino
40. Nathan J. Kaplan
41. Edward T. Scholl
42. Mayer Goldberg
43. Mathias Bauler
44. Thomas Rosenberg
45. Edwin P. Fifielski
46. Joseph R. Kerwin
47. John J. Hoellen

(a) Deceased

Robert F. Campbell, Record Clerk

Michael Coletta, Assistant Sergeant-at-Arms

Alec Busta, Assistant

The Honorable Richard J. Daley, Mayor  
The Honorable Members of the City Council  
City of Chicago, Illinois

Gentlemen:

In this Annual Report we have attempted to highlight, in pictorial form with a the important activities and accomplishments of the Department of Water and Sewers

The Bureau of Water carries the responsibility for supplying water to a popula including all the residents of Chicago and the 63 suburbs served by the Chicago Wa area of 402 square miles. The Department's other Bureau, the Bureau of Se responsibility for operating the Sewer System which collects the sanitary and storm the City's 227 square miles.

At the year end, the facilities of the Chicago Water System included four intake to four miles out in the Lake, the two largest water treatment plants in the world, a l of water supply tunnels 6 to 16 feet in diameter, ten pumping stations, and some 4,0 mains ranging in size from 4 to 60 inches in diameter. The Sewer System consists 4,000 miles of conduit ranging in size from 10-inch diameter tile pipe to the large co feet wide by 19.3 feet high. We are pleased to report that the Department rendered of service all during the year on an around-the-clock basis in the operation of t Systems.

The present top ratings enjoyed by the Chicago Water and Sewer Systems were by accident, but rather are the direct result of carefully planning ahead. Presently, t System has the capability of meeting the requirements expected to be placed upon i to 1980. Further, the effective operation of the Chicago Water and Sewer Systems is reasons why Chicago has gained a national reputation for its vitality and the dync economy.

While the Department is proud of its achievements, we recognize that it would no ble to accomplish them, Mr. Mayor, without your leadership and guidance and the members of the City Council. We also appreciate very much the help that was giver year by the various other governmental agencies, industrial organizations and the p wish to publicly thank the employees of the Department for the conscientious manner in which they discharged their responsibilities all during the year. We are fully aware that the Department would have had little success without such dedicated effort on the part of each one of them.

Respectfully submitted,

*James W. Sullivan*  
Commissioner

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City of Chicago, Department  
ANNUAL REPORT,  
DEPARTMENT OF WATER  
AND SEWERS, CITY OF  
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City of Chicago, Department  
ANNUAL REPORT,  
DEPARTMENT OF WATER  
AND SEWERS, CITY OF  
CHICAGO.

DEMCO



THE OLD WATER TOWER . . . Symbol of Chicago's past, signifying the great faith of her early citizens in their City's future . . . a memorial to the victims of the Great Fire and to the indestructible will to endure of a great city.



★ In its first full year of operation, the new Central District Filtration Plant treated an average of 640 million gallons of water per day and a maximum for a day of 947 million gallons on July 23. Control of chemical application, paced by water flow, was activated and proven to be accurate and reliable, and automated sequential backwashing of the 96 sand filters was initiated. The computer data logger was received in December and it is expected to be logging and performing pertinent computations before mid-year of 1966.

★ The South District Filtration Plant treated an average of 375 million gallons of water per day and a maximum for a day of 588 million gallons on July 23. Construction proceeded satisfactorily on the fifty percent expansion of this plant and it is expected that the additional facilities will be in operation by the middle of 1966 providing a peak plant capacity of over 850 million gallons per day.

★ A total of \$15,771,780 was invested in capital improvements in the Water System. The Five-Year Water System Capital Improvement Program, 1966-1970, calls for the investment of an additional \$54,220,000.

★ Water Distribution Division work forces constructed and placed in service a total of 19.42 miles of water mains ranging in size from 6 to 54 inches in diameter. These mains were installed in various areas of the City and improved the water service to thousands of water users.

★ Over 27 miles of new sewers ranging in size up to 12 by 12 feet, 956 manholes and 1,296 catch basins were added to the public sewer system. These new sewers and appurtenances improved drainage where needed in many areas of the City.

★ Water Distribution engineering forces continued, at an accelerated pace, their successful effort in detecting underground leaks using a new type of electronic leak detection equipment. During the year 2,835 leaks were detected and repaired on 2,143 miles of water mains. Each year the Division comes a step closer to its goal of maintaining a comparatively tight distribution system.

★ A total of 361,559 million gallons of water, an average of about 990.6 million gallons per day, was pumped by the pumping stations into the distribution system. The average daily pumpage was a little over 55 million gallons per day less than that for 1964 and the lowest daily average for the system since 1952. The stepped up distribution system leak detection and repair program and the discovery and stopping of leaks within buildings were important factors in this reduction of pumpage. Furthermore, less water was pumped to serve an increased population with no reduction in the level of service furnished.

★ Revised specifications for the procurement of water meters were developed and approved by the Board of Standardization of the Department of Purchases, Contracts and Supplies. The new specifications will allow for the purchase, for the first time by the Chicago Water System, of meters of the magnetic type with sealed registers and direct-reading dials. The new meters should make possible significant savings in maintenance and meter reading costs.

★ The old Lake View steam pumping station, obtained by annexation in 1889, was retired from service on May 31, 1965. Construction of a new Lake View electric powered, remote-controlled, peaking station was started and it is expected that this 105 million gallon per day capacity station will be ready for operation late in 1966.

★ The total cash receipts of the Water Fund in 1965 amounted to \$56,469,818. Of this amount \$55,751,193 were collected by the Collection Division from metered-rate accounts, assessed-rate accounts, sewer rental accounts and miscellaneous sources.

★ The Bureau of Sewers survey crews ran 146 miles of precise levels to establish elevations for 104 street grades, 8 standard bench monuments and 82 ordinary benches.

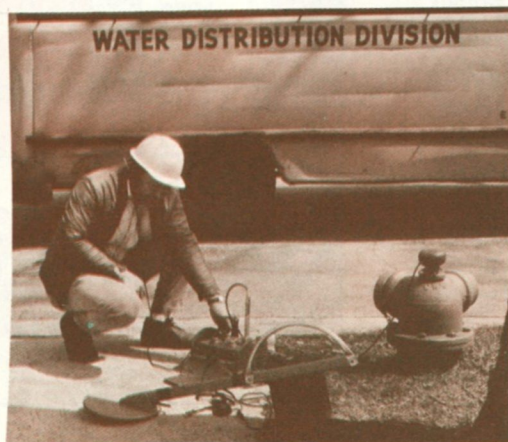
★ The new Central District Filtration Plant won the American Society of Civil Engineers Award of Merit and the Chicago Building Congress Merit Award, in 1965, as an outstanding engineering and building construction achievement.



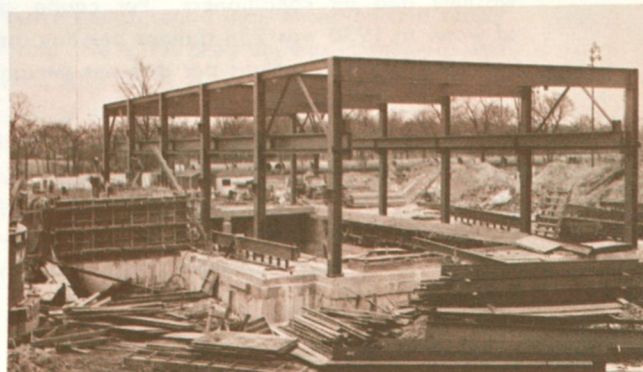
# highlights



SEWER CONSTRUCTION



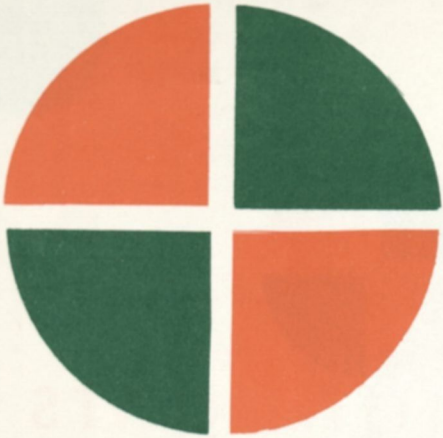
UNDERGROUND LEAKAGE CONTROL



NEW LAKE VIEW PUMPING STATION



# water conservation



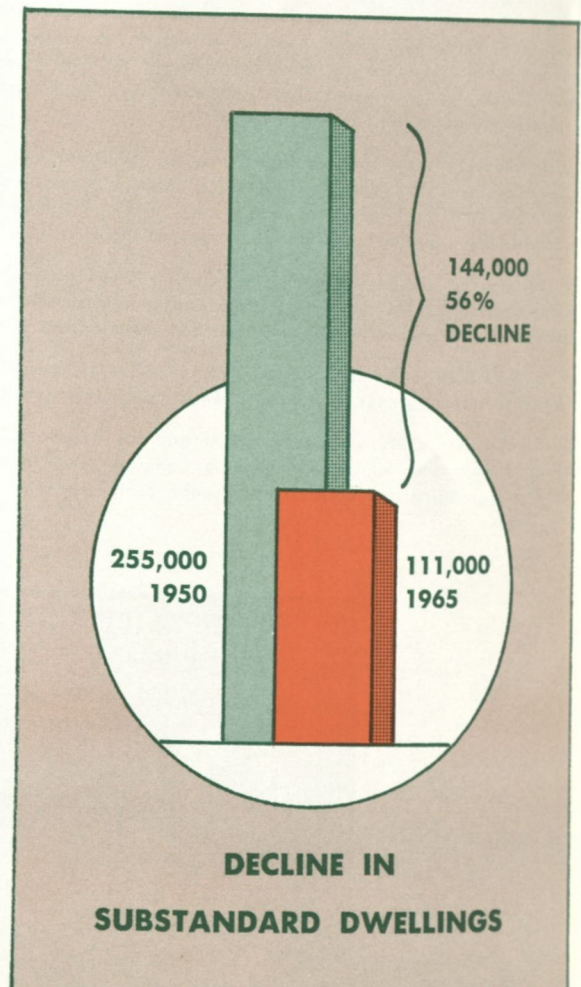
Widespread concern about the pollution of the water resources of the country has focused much public attention on the need to clean up and conserve these resources to a far greater extent than has been the case in the past. Special effort is being given at all levels of government to programming for the abatement of the pollution and the conservation of all water resources. Water pollution and water conservation are closely related and can best be treated if they are recognized as one problem and handled under a total water management program. In Chicago, the recent Federal Water Pollution Conference has sparked action by state and local governments and major industries. Thus, even in Chicago where abundant water has influenced the growth of the nation's second largest City, water conservation has become a public watch-word.

Chicago's water usage in 1965 was less in both total gallons pumped and per capita usage than in the year 1930. This is worthy of note since the population served by the Chicago Water System, City and suburbs, has increased by 25 percent during this 35-year period. At the same time, the standard of living of the residents of Chicagoland has risen steadily which means there has been increased water use for consumption, sanitary purposes, lawn sprinkling, and in appliances such as dishwashers, garbage disposal units, automatic clothes washers and air conditioners. Per capita consumption of water in 1930 was 288 gallons per day, and in 1965 it declined to 216 gallons per day per person.

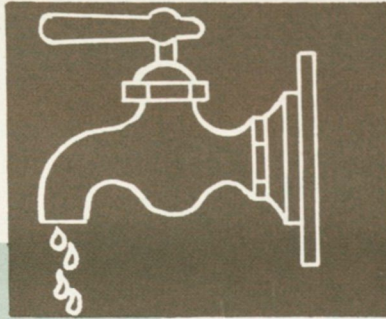
In order to explain this reduction, we must consider some of the factors which influence the use of water. Obviously, weather is a major factor. The water usage in very cold winters and very hot summers is usually greater than in the more moderate ones. Similarly, in years



Engineers run flow test in underground leakage control program. 2,835 leaks were detected and repaired in 1965.







Plumbing Inspectors made 57,516 inspections in 1965 to help control water wastage.

AMOUNT OF WASTAGE	SIZE OF OPENING
5,000 GALS.	1/32" •
18,000 GALS.	1/16" •
72,000 GALS.	1/8" •
163,000 GALS.	3/16" •
287,000 GALS.	1/4" •

### WATER WASTED IN 30 DAYS WITH 30 LBS. PRESSURE

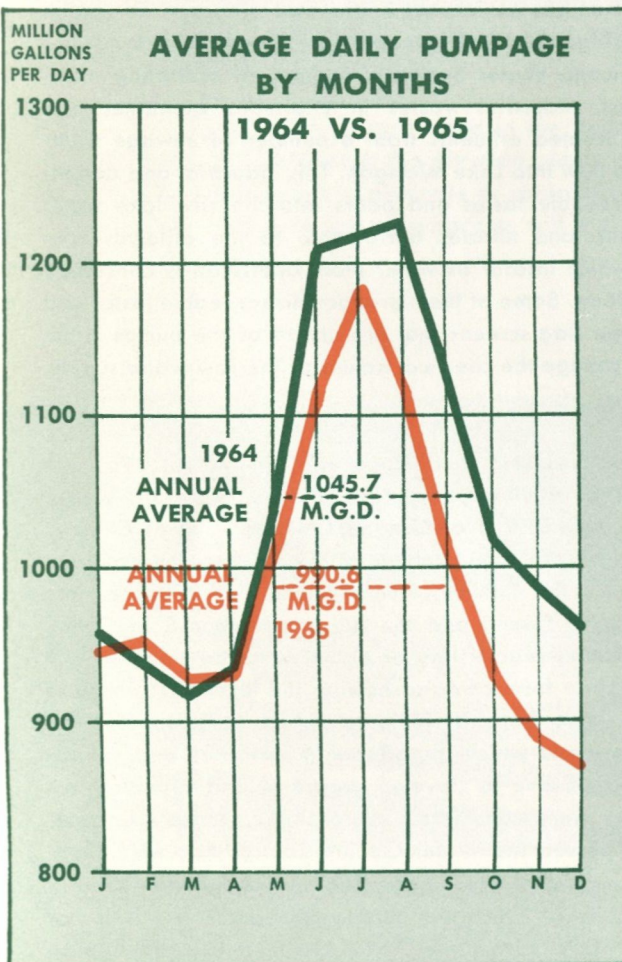
when the annual precipitation (rain and snow) is less than normal, increased water demands result. Since 1965 was not a particularly harsh year, weather-wise, a part of the reduction in water usage might be attributed to this factor.

In accounting for the reduction, consideration must be given also to the quality of housing in the area served by the Chicago Water System. High water consumption is typical in slum and blighted housing, primarily because of leaky plumbing. A comparison of the number of sub-standard housing units in the years 1950 and 1965 discloses that, during this period of 16 years, the number of sub-standard housing units was reduced from 255,000 to 111,000 units, a decline of 56 percent. This reduction of sub-standard units is largely a result of the City's urban renewal and expressway construction programs and the active inspection program of the Department of Buildings.

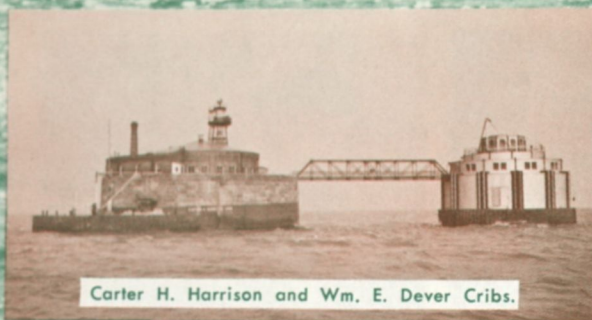
Another major factor which contributed to the conservation of water in Chicago is the active plumbing inspection program carried on by this Department. Last year, approximately 57,516 plumbing inspections were made. Since the wastage of water through leaky plumbing fixtures, such as faucets, water closets and sill cocks, can be measured in hundreds or even thousands of gallons per day, inspection and repair of leaking fixtures greatly contributes to a reduction in the total water needs of the community.

Another program which deserves major credit for achieving conservation in the use of water is the Department's aggressive underground leak detection and repair program. During 1965, this program was intensified, and approximately 2,835 leaks were detected and repaired in 2,143 miles of water mains. Repair of these leaks enabled the City to continue to reduce its water requirements in 1965, and to come closer to its goal of having a comparatively tight underground distribution system.

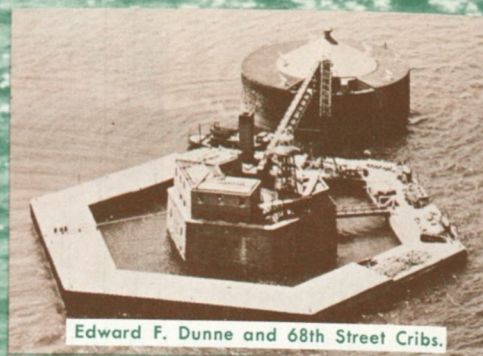
Finally, the public must be commended for its co-operation since only with public awareness and support can a true water conservation program ever achieve success.







Carter H. Harrison and Wm. E. Dever Cribs.



Edward F. Dunne and 68th Street Cribs.



## pure water

**RAW WATER SUPPLY**—The City of Chicago is most fortunate in having an abundant source of fresh water available at its doorstep. Lake Michigan is a part of the Great Lakes system which, according to some authorities, contains about 57% of the world's soft, fresh, surface water. While nature has been very kind to Chicago in providing an ample water supply, man has not always been so considerate. The pollution of the southern end of Lake Michigan has been continually increasing for a number of years, thus creating for the Chicago Water System a number of operating problems that did not previously exist. Industrial wastes in enormous quantities and complexity, and the inadequately treated effluents from a number of sewage treatment systems, have been allowed to flow into Lake Michigan. This industrial and domestic pollution has introduced disagreeable tastes and odors into the raw lake water supply. In addition, the phosphates and nitrates attributable to the effluents contribute to the growth of plankton which insofar as water plant operation is concerned fall into two classes, algae and diatoms. Some of them produce disagreeable tastes and odors, some of the filamentous algae clog screens that are ahead of the pumps in the filtration plants, and some of them change the chemical nature of the raw water supply, making it more difficult to treat.

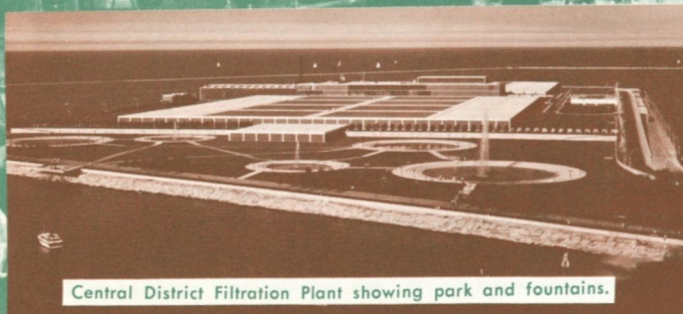
A federal pollution conference was held in Chicago early in March, 1965, attended by representatives from the regulatory agencies of the State of Illinois, State of Indiana, Metropolitan Sanitary District of Greater Chicago, City of Chicago and numerous industries, to discuss the pollution problem in the southern end of Lake Michigan and its principal tributaries, the Calumet River (including its branches, the Grand Calumet and the Little Calumet Rivers) and the Indiana Harbor Ship Canal. The City of Chicago presented a fifteen-year history of pollution in the southern end of Lake Michigan and its tributaries in a form of data showing the level of the various characteristics that are considered important criteria for a public water supply. This report became the basis of a program in which the offending industries and municipalities were given definite periods of time to develop programs and plans for reducing the pollution for which they were considered responsible. During the year, the Congress of the United States passed the Water Quality Control Act, which provides among other things that the individual states can establish water quality criteria similar to those proposed by the City of Chicago's Bureau of Water. If this is not done, the Federal Government will then have the right to step in and establish such criteria. It is hoped that this program of water pollution control will reduce the pollution of the southern end of Lake Michigan and result in an improved raw water supply for the City of Chicago.



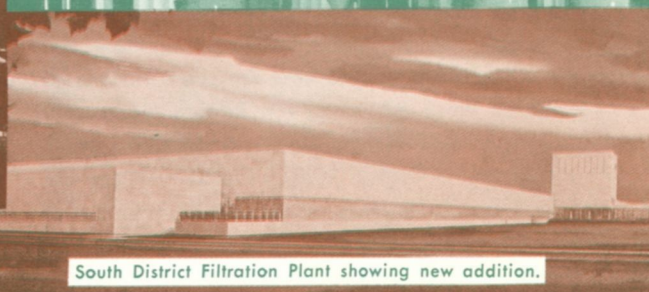
Since October 29, 1964, the entire City of Chicago and the sixty-three suburbs served by the Chicago Water System, have received filtered water. When certain tunnel connections are completed, the new Central District Filtration Plant will be able to obtain its water supply from either the Dever Crib, 2.65 miles out in the lake or from the plant shore intake which is approximately 3,000 feet from shore. The South District Filtration Plant may take its water from either Dunne Crib, 2.0 miles from shore or from the plant shore intake which is approximately 2,500 feet from shore. Generally, the quality of water at the crib intakes is better than that from the shore intakes.

**CHEMICAL TREATMENT**—The broad principles of chemical treatment required by the water taken by Chicago from Lake Michigan were worked out at Chicago's famous Experimental Filtration Plant which was located at 68th Street and Oglesby Avenue under the direction of the late John R. Baylis. Consequently, the chemical treatment followed at both the Central and South Filtration Plants are essentially the same. Chlorine is added to the water for the purpose of destroying harmful bacteria and on rare occasions to oxidize certain tastes and odors; coagulation is accomplished by the addition of aluminum sulfate and chlorinated ferrous sulfate; obnoxious tastes and odors are adsorbed from the water by the use of activated carbon. The adjustment of the alkalinity of the treated water so as to minimize corrosion in the distribution system is accomplished by the addition of lime. Provision has been made at both plants for the addition of anhydrous liquid ammonia to the water after filtration in the ratio four parts of chlorine to one part of ammonia to reduce chlorinous tastes and to give a more persistent residual and therefore a better bacteriocidal action. Fluorides, to reduce dental caries in children, have been added to the water in accordance with a Council order since 1956.

Due to the upward trend in the pollution of the raw water supply, the cost of chemical treatment at the filtration plants continues to rise each year as more chemicals are required to eliminate or control its effects on the lake water. It is hoped that water pollution control programs will make it possible to reduce these costs in the years ahead.



Central District Filtration Plant showing park and fountains.



South District Filtration Plant showing new addition.





More than 477,000 tests were made in the Department's laboratories during the year to guard the purity of Chicago's water supply.

## purification

**FILTRATION**—For many years water purification engineers have based their design of filtration plants on a standard filtration rate of 2 gallons per square foot per minute. In the days when water demand was confined principally to domestic usage, these rates were adequate. The work of Mr. Baylis at the experimental filter plant showed that with adequate pretreatment and settling, a much higher rate of filtration could be used. Consequently, in the South District Filtration Plant the filter beds, piping and controls were designed so that the filtration rate could actually be 5 gallons per square foot per minute. This resulted in a much lower capital expenditure to construct the plant than would have been required had the filtration rate been kept at the lower rate. On a number of occasions, the South District Filtration Plant has been operated at the maximum rate for short periods of time. On all of these occasions the filtered water produced was completely clear, palatable, and safe to drink. The filters at the new Central District Filtration Plant and the forty additional filters recently constructed at the South District Filtration Plant also were designed as high rate filters. Since the Chicago Water System has little reserve storage, it is necessary to have filtration capacity

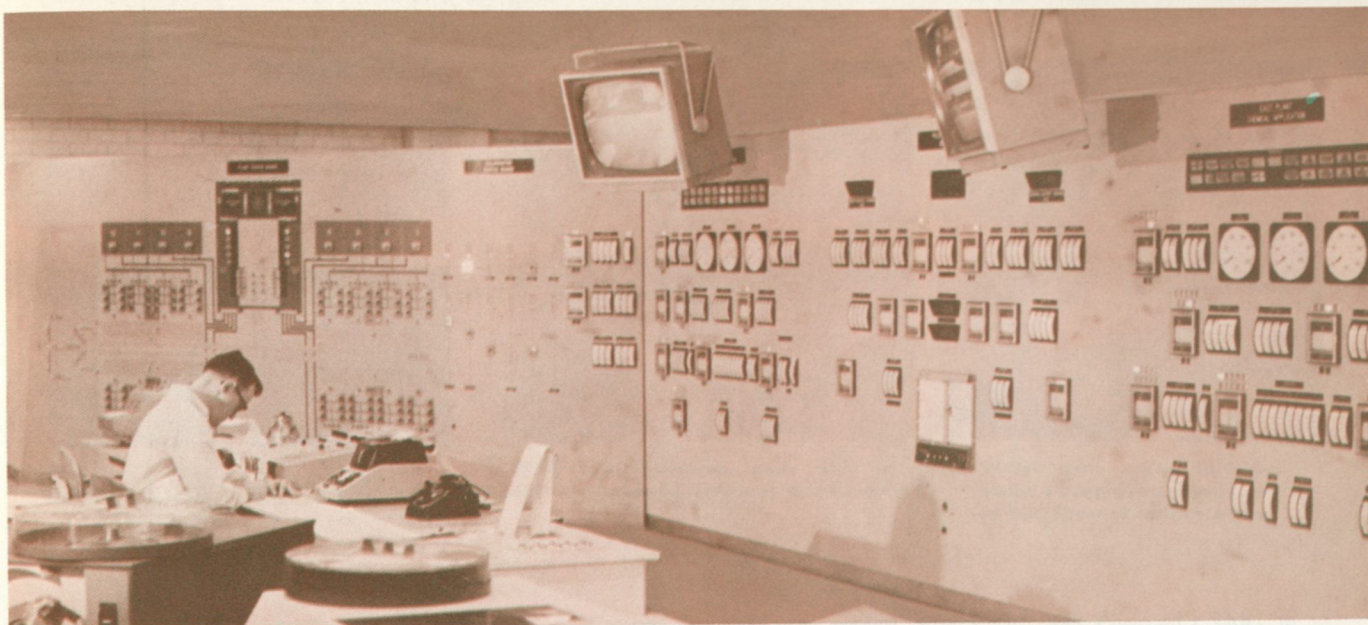
to meet the peak hour on a peak demand day. These higher rates of filtration are made possible by adequate pretreatment, adequate settling time and adequate technical control over the chemical treatment and water quality. To maintain satisfactory technical control, each filtration plant has a control laboratory which operates twenty-four hours of every day. From the results of the tests made by this laboratory, the control engineers make their decisions as to the specific chemical treatment to be used for the raw water.

**STORAGE**—To compensate for the limited amount of storage capacity to store finished water, all items of equipment in the Chicago Water System are installed in multiple units wherever possible. Pumps, piping and chemical feeding equipment in the two filtration plants have alternate units so that in the case of the failure of one unit, the standby unit may be placed in service immediately. Emergency power generating equipment is installed at both filtration plants to be used in case of a complete power failure to provide lighting and pumping capacity enough to chlorinate the lake water which then would be supplied to users by by-passing the plant.



Mayor Richard J. Daley activates the five fountains in the new park at the Central District Filtration Plant.





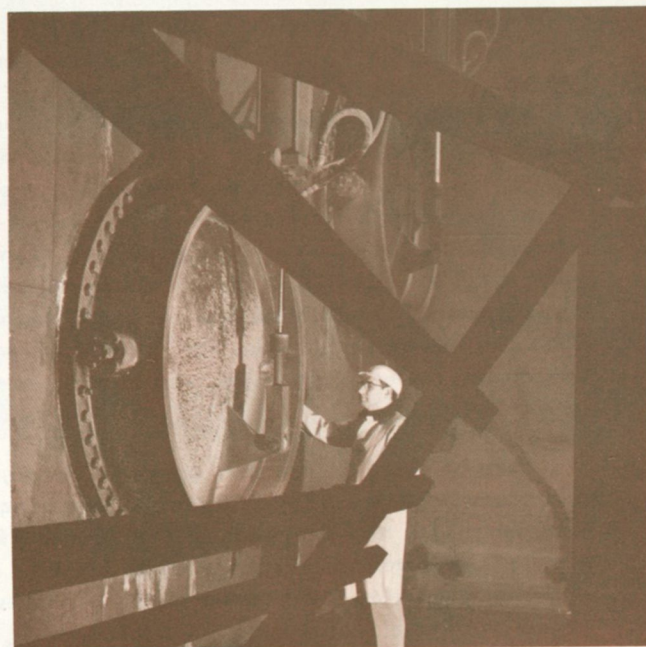
The central control panel at the Central District Filtration Plant has more than 340 instruments to monitor water flow, chemical feed, elevation, chemical analysis and meteorological conditions.

The Central District Filtration Plant supplied an average of 640 million gallons of filtered water a day in 1965, producing a maximum for a day of 947 million gallons on July 23 and at a maximum hourly rate of 1180 million gallons a day at 1:30 P.M. on July 23.

The South District Filtration Plant supplied an average of 375 million gallons of filtered water a day in 1965, producing a maximum for a day of 588 million gallons on July 23, and at a maximum rate of 721 million gallons a day at 3:00 P.M. on July 23.

The activities of the Water Safety Control Section provide additional measures to assure the delivery of a safe, potable water supply to the users by maintaining a 24-hour vigil over the chemical treatment of the water at the pumping stations in the north and central tunnel zones, reviewing water works plans and recommending improvements, and sterilizing many miles of water mains, tunnels and shafts. The section also monitored the quality of the water supply by making pollution surveys, keeping dredging operations under surveillance and making statistical studies of the field data. In the overall control program during 1965, some 60,875 water samples were collected from Lake Michigan, Calumet River System, intake cribs, filter plants, pumping stations and the distribution system.

The chemical and bacteriological laboratories ran 473,917 tests of water samples. The electron microscope was particularly valuable for examining samples and obtaining results quickly where needed. A total of 3717 such microscopic examinations were made during the year.



Two 66-inch hydraulically controlled butterfly valves which regulate the flow of water to a mixing basin.

#### Merit Awards Received By Central District Filtration Plant.





# distribution



In 1842 Chicago's first distribution system consisted of only two miles of wooden water mains, made from bored logs with internal diameters ranging from two to six inches.

From this humble beginning, the system grew until in 1965 it consisted of a network of 4083 miles of underground pipe made of cast iron, steel, ductile iron and concrete varying in size from 4 to 60 inches in diameter. Almost every street in Chicago, on which a building is located, has a water main under the street and fire hydrants close enough for fire protection. A twenty-four hour a day delivery service was maintained to make water available to 509,297 service outlets to multiple story buildings, schools, churches, hospitals, factories, stores and other types of properties. In addition, water was delivered at Chicago's city limits to 63 suburban communities.

Keeping pace with the ever growing Chicago, Division construction crews, using the most modern equipment, installed a total of 19.41 miles of pipe in 1965, ranging in diameter from 6 to 54 inches. About 17.4% of the pipe installed were feeder mains 24 inches or larger in diameter. Some unusual problems were encountered in the construction of the large mains. One such problem developed in laying a 36-inch concrete pipe along an expressway where there was not enough space available to install proper thrust blocks and piers at the various bends to withstand the tremendous thrust built up within the pipe. This was solved by using special metal clamps to join the sections of pipe. With these special clamped joints the entire section of pipe can resist up to 40 tons of thrust at the critical bend locations.

The principal large diameter water main construction projects completed during the year were:

- ★ 1572 feet of 36-inch diameter pipe in 103rd Street from Racine Avenue to Charles Street.
- ★ 482 feet of 48-inch diameter pipe in 104th Street (tunnel under Illinois Central Railroad) from Cottage Grove Avenue to Dauphin Avenue.
- ★ 2309 feet of 48-inch diameter pipe in Newberry Street from 14th Street to 18th Street and in Peoria Street from 18th Street to 18th Place.
- ★ 1836 feet of 48-inch diameter pipe in Northwest Highway from Bryn Mawr Avenue to Nagle Avenue.
- ★ 363 feet of 30-inch diameter pipe in Wilson Avenue from Clarendon Avenue to Marine Drive.
- ★ 930 feet of 36-inch and 790 feet of 30-inch diameter pipe in University of Illinois, Chicago Circle Campus from Eisenhower Expressway to Roosevelt Road.
- ★ 1073 feet of 48-inch diameter pipe in Halsted Street from 105th Street to the west leg of the Dan Ryan Expressway.
- ★ 6784 feet of 30-inch diameter pipe along the west leg of the Dan Ryan Expressway from 105th Street to 121st Street.

In addition, the Division forces also kept the 4083 miles of water mains, 42,000 valves and 45,500 fire hydrants in a good state of repair and in satisfactory operating condition at all times during the year.

During 1965 the Leak Detection Section, using modern electronic leak detecting equipment, continued to check the distribution system for leakage at an accelerated pace. A total of 2835 leaks were detected and stopped on 2142.83 miles of pipe. Thus, each year the system comes a step closer to its goal of maintaining a comparatively tight distribution system.

Plumbing inspectors made 5547 first inspections during 1965; 1589 reinspections; 2278 wrecked building inspections; 15,666 building permit and service pipe inspections; 2645 meter inspections and 8788 water contamination prevention inspections all in the interests of supplying a potable water, when, where and in the amount needed.





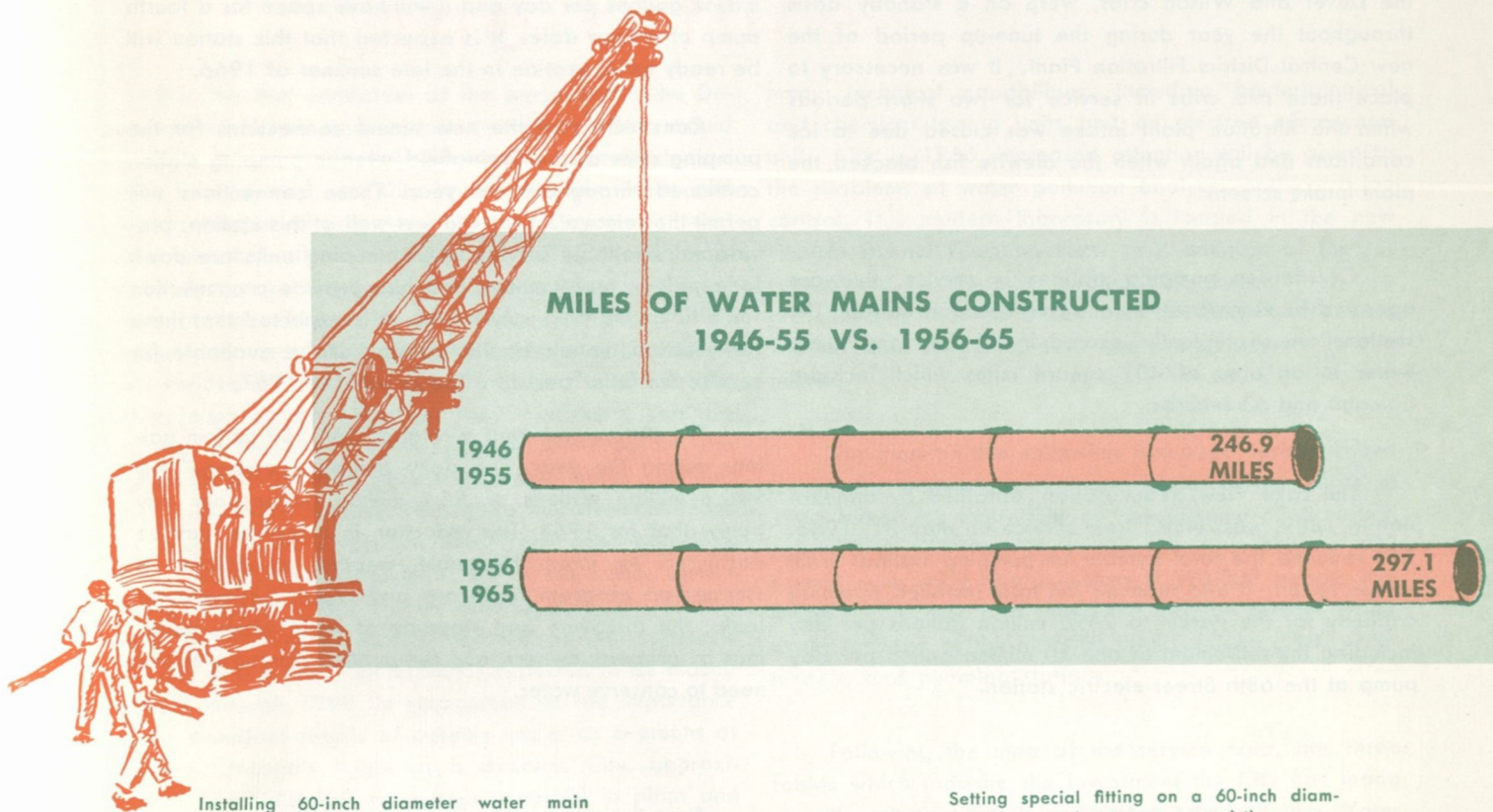
Engineer inspects 60-inch diameter pre-stressed concrete bend in new water main.



Installing 36-inch diameter water main in Federal Street near the Stevenson Expressway.



Water main being installed under a telephone company duct in 24th Street at Wabash Avenue.



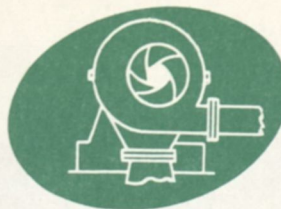
Installing 60-inch diameter water main at the new Lake View Pumping Station.



Setting special fitting on a 60-inch diameter water main to cross an existing sewer.



# pumping



The four intake cribs in Lake Michigan are under the jurisdiction of the Pumping Station Operation Division. The most southerly intake, the Dunne Crib, was in continuous operation all year supplying part of the water to the South District Filtration Plant. The Four-mile Crib supplied water to the Chicago Park District's small pumping station during the summer months only. The other two, the Dever and Wilson cribs, were on a standby basis throughout the year during the tune-up period of the new Central District Filtration Plant. It was necessary to place these two cribs in service for two short periods when the filtration plant intake was closed due to ice conditions and again when the alewife fish blocked the plant intake screens.

Of the ten pumping stations in service, five are operated by electric power and five by steam power. The stations are strategically located in the City and pump water to an area of 402 square miles which includes Chicago and 63 suburbs.

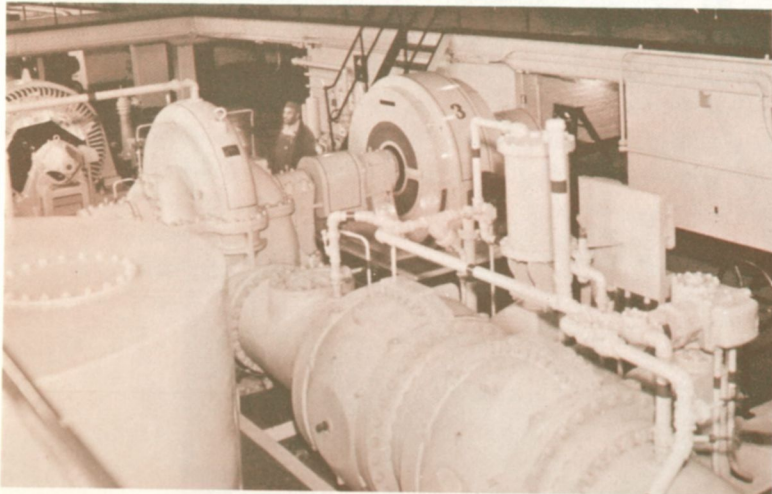
The Lake View steam station, obtained by annexation in 1889, was retired from service on May 31, 1965. This reduced the total number of pumping stations from eleven to ten. It also reduced the total installed pumping capacity for the system to 2890 million gallons per day including the retirement of one 40 million gallon per day pump at the 68th Street electric station.

Construction on a new Lake View pumping station was started in April, 1965. This will be an all electric-powered pumping station which will be remotely controlled from the Thomas Jefferson pumping station and used only during peak demand periods. It will be provided with three 35-million gallon per day pumps increasing the pumping capacity in the system to 2995 million gallons per day and it will have space for a fourth pump at a later date. It is expected that this station will be ready for operation in the late summer of 1966.

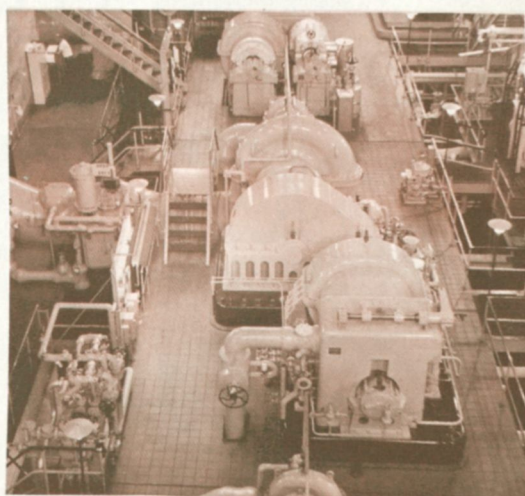
Construction of the new tunnel connections for the pumping units at the Springfield Avenue pumping station continued throughout the year. These connections will permit the removal of the old wet-well at this station, provide more reliable service when pumping units are down for repair or replacement, and also provide a connection for a future water supply tunnel. It is expected that these new suction tunnels at this station will be available for service the latter part of 1966 or early in 1967.

The stations pumped a total of 361,559 million gallons during the year. The daily average pumpage was 990.6 million gallons or 55.1 million gallons per day below that for 1964. The reduction in pumpage may be attributed to more favorable weather conditions, a stepped-up program to locate and repair underground leaks, the discovery and stopping of leaks within buildings by property owners, and the public awareness of the need to conserve water.

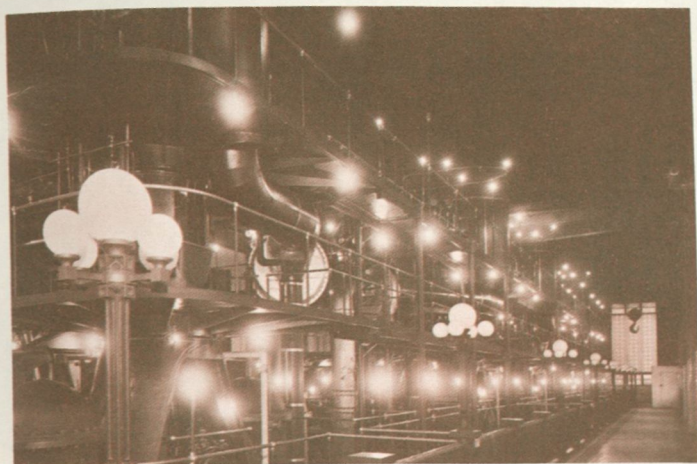
Electric motor-driven 50 million gallon per day pump at the 68th Street Pumping Station.



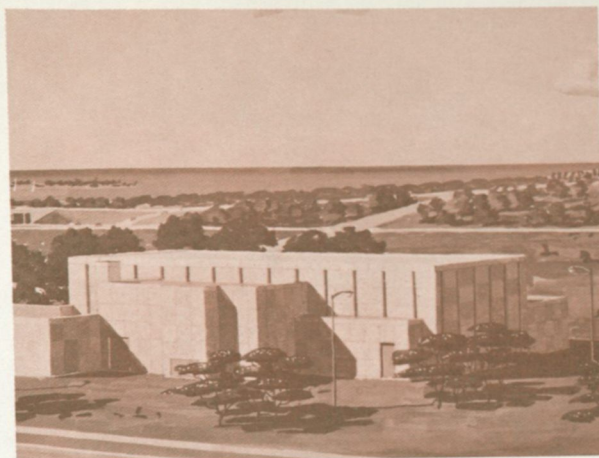
Steam turbine-driven 85 million gallon per day pump at the Western Avenue Pumping Station.







The old Lake View Pumping Station, obtained by annexation in 1889, was retired in 1965 after 76 years of service in the Chicago Water System.



The new remotely controlled, electrically powered Lake View Pumping Station, now under construction, will have a capacity of 105 million gallons per day.

## the future

It is the firm conviction of the personnel in the Department of Water and Sewers that every effort should be made to see to it that Chicago is maintained as a clean, healthy, and safe City in which to live, work, and play. In support of this conviction, the Department must make sure that all of the public served by the Chicago Water System receive now and in the future, water of the highest possible quality and safety, and in quantities adequate to meet all needs including industrial, commercial, residential, and recreational uses. To aid in the achievement of this objective, the Department annually prepares a Five-Year Capital Improvement Program, designed to provide the necessary water works facilities when and where needed. That these improvement plans and programs have been successful, one need only look at the results obtained to date. All of the public served by the Chicago Water System receive pure and filtered water of the highest quality, and the present system is capable of satisfying the demands expected to be placed upon it through 1980. In recognition of the importance of an abundant supply of potable water as a means of insuring Chicago's future as a dynamic City, approximately \$240,000,000 have been invested in plant and facilities since 1955.

To aid the Department's water conservation program, a Water Purification Laboratory was created in January, 1965, as part of the Water Purification Division. It is intended that the laboratory will provide research and development potential for the entire Water System—to accelerate and expand efforts to devise ways and means of conserving water in all activities of the Department. Since the quality of raw water from Lake Michigan varies seasonally, variable quantities of chemicals are required to insure proper treatment so as to maintain the safety and high quality of the water furnished. In 1966, research studies designed to reduce the amount of chemicals required to achieve high water quality will be undertaken. The new laboratory has

many technical capabilities, including bacteriological and chemical testing units and an electron microscope unit. Also in 1966, increased attention will be given to the problems of water pollution analyses and corrosion control. This modern laboratory is located in the new Central District Filtration Plant and, because of the research and development capabilities inherent in it, we are confident that the Department of Water and Sewers will be able to continue to improve its service to the public.

The map on the following two-page spread shows the service area of the Chicago Water System which in 1965 served the entire City of Chicago and 63 suburban communities. This service area encompasses some 402 square miles, and approximately 4,590,000 people live within it. The map also shows the location of such water works facilities as the filtration plants, intake cribs, water tunnels, and pumping stations.

Following the map of the service area, are three tables which indicate the investment the City has made or will make in capital improvements to both the Water and Sewer Systems. Table I is a record of capital investments made during the period 1955 through 1965. A second Table describes the trend in the capabilities of the Water System by comparing the facilities available in the years 1945, 1955, 1965, and 1966. A third Table lists the scheduled expenditures by category for future capital improvements covering the period 1966 through 1970.

Since the Chicago Metropolitan Area is growing rapidly, the Water and Sewer Systems must also continue to expand their capabilities so as to stay abreast of this growth if they are to continue to provide the level of water supply and drainage services required to insure the health and safety of all the people served by them.



CITY OF CHICAGO

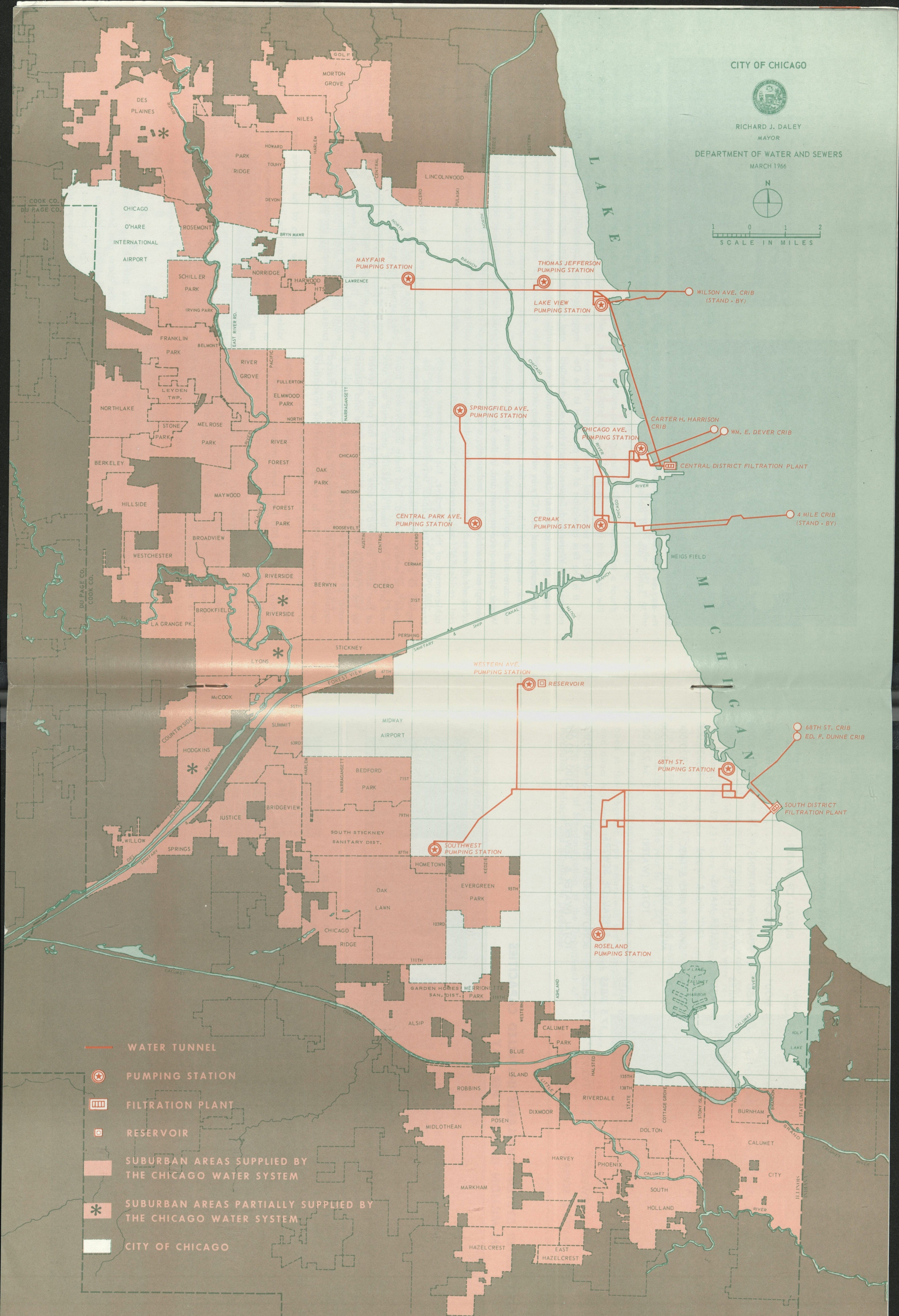


RICHARD J. DALEY  
MAYOR

DEPARTMENT OF WATER AND SEWERS  
MARCH 1966



1 0 1 2  
SCALE IN MILES



WATER TUNNEL



PUMPING STATION



FILTRATION PLANT



RESERVOIR



SUBURBAN AREAS SUPPLIED BY  
THE CHICAGO WATER SYSTEM



SUBURBAN AREAS PARTIALLY SUPPLIED BY  
THE CHICAGO WATER SYSTEM



CITY OF CHICAGO

THE CHICAGO WATER SYSTEM SERVICE AREA - 1965



# DEPARTMENT OF WATER AND SEWERS

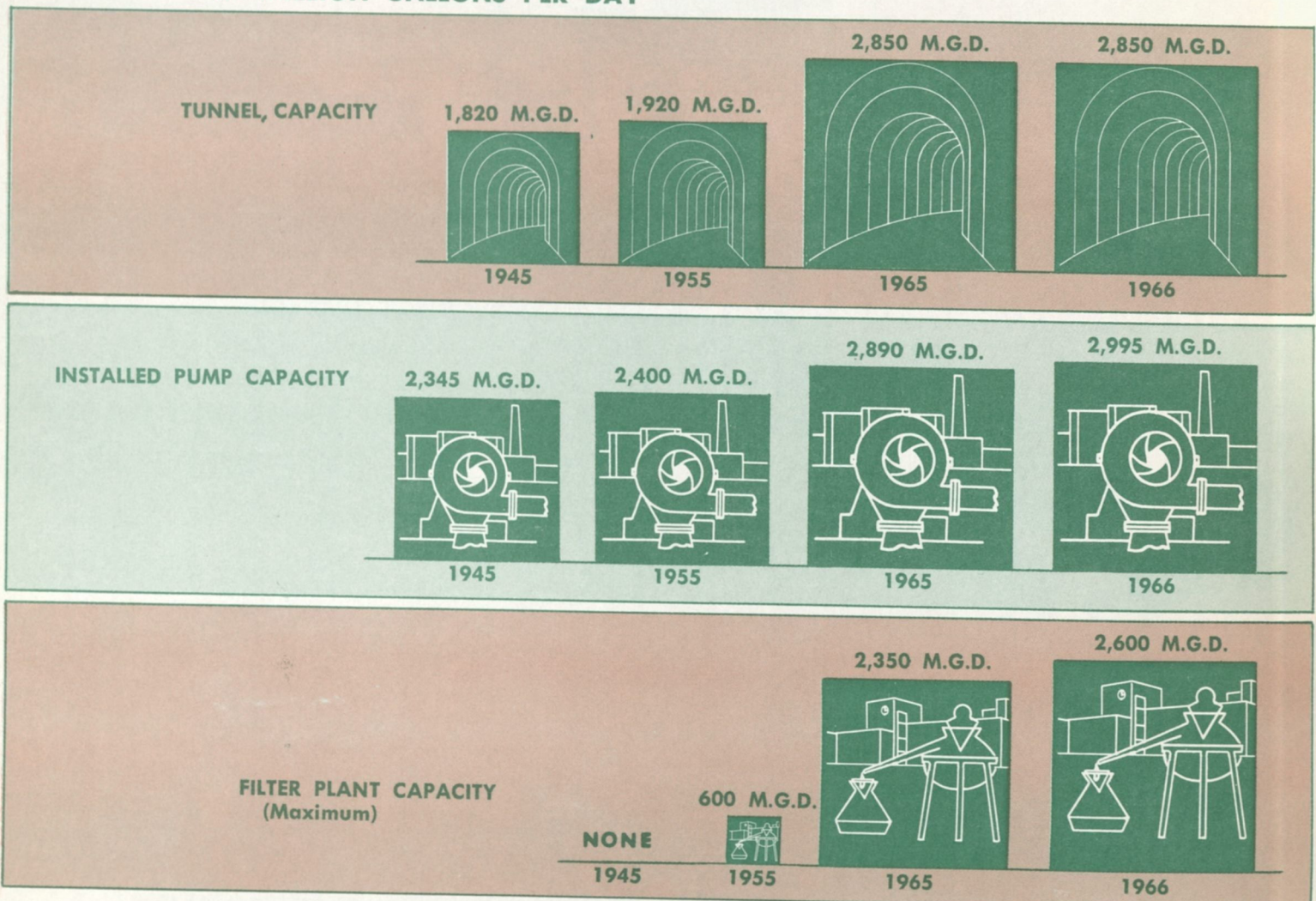
## CAPITAL IMPROVEMENTS COMPLETED 1955-1965

BUREAU OF WATER:	Investment (Dollars)	Capacity Added
FILTRATION PLANTS .....	\$103,908,735	1700 MGD*
PUMPING STATIONS & MISC. ITEMS .....	36,854,312	490 MGD
WATER TUNNELS & CRIBS .....	33,018,775	11.0 MILES
WATER MAINS .....	67,704,974	339.6 MILES
TOTAL (WATER) .....	\$240,486,796	
		*Million Gallons Per Day
BUREAU OF SEWERS:		
SEWERS:		
LARGER THAN 27" IN DIAMETER .....		83.6 MILES
27" IN DIAMETER AND SMALLER .....		17.5 MILES
TOTAL (SEWERS) .....	\$ 59,193,924	101.1 MILES
TOTAL (WATER & SEWERS) .....	\$299,680,720	

## CAPITAL IMPROVEMENTS PROGRAM 1966-70

BUREAU OF WATER:	Investment (Dollars)
FILTRATION PLANTS .....	\$ 7,937,000
PUMPING STATIONS .....	14,753,000
WATER TUNNELS .....	2,246,000
FEEDER MAINS:	
(24" dia. & larger) .....	13,339,000
SMALL MAINS & MISC. ....	14,620,000
MISCELLANEOUS .....	1,325,000
TOTAL (WATER) .....	\$ 54,220,000
BUREAU OF SEWERS:	
BOND PROGRAM SEWERS .....	\$ 46,000,000
TOTAL (WATER & SEWERS) ....	\$100,220,000

## CHICAGO WATER SYSTEM—AVAILABLE INSTALLED CAPACITIES IN MILLION GALLONS PER DAY

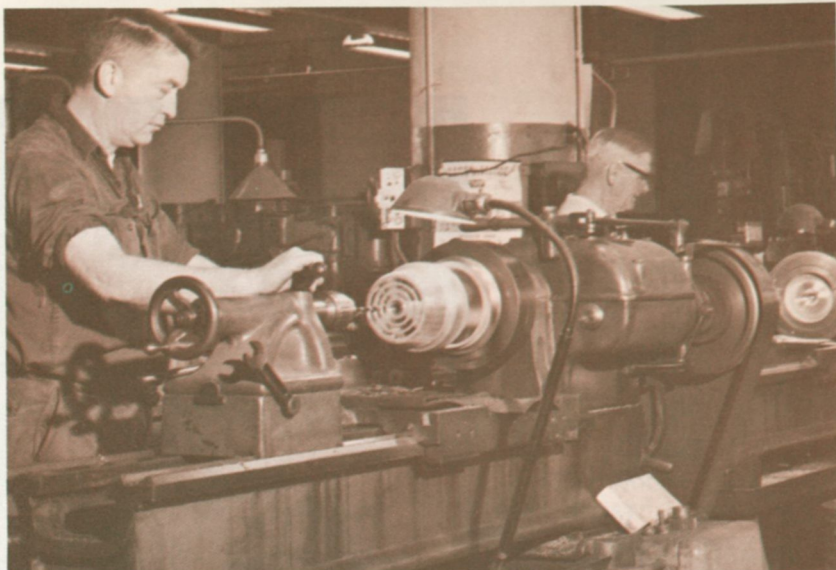




# metering

The activities of the Water Meter Division embrace both field and shop work. Repairs to 18,474 water meters were made in the field and 16,010 meters were reconditioned and 17,731 were tested for accuracy in the shop. During the year, 3,214 water meters ranging in size from  $\frac{5}{8}$  inch to 12 inches were installed increasing the total number of meters in service in the waterworks system at the end of the year to 161,341.

Revised specifications for water meters were developed so that magnetic type meters with sealed registers and direct reading dials can be obtained through procurement in 1966. The new specification was approved by the Board of Standardization of the Department of Purchases, Contracts and Supplies in December.



More than 16,000 meters were reconditioned in the Department Meter Shop in 1965.

# assessing billing and collecting

After exhaustive studies of the assessing, billing and accounting procedures and equipment, management decided to convert the present electronic machine system to a computer system. Following through on this decision, arrangements were made to obtain the equipment and the computer system is to be installed in mid 1966. With the new equipment, the Collection Division will be able to function with greater speed and effectiveness. It will be possible also to obtain, for the use of management and engineering staffs, complete and timely information on each customer account, or groups of accounts by type and area, from the great amount of data stored in the memory system of the equipment.

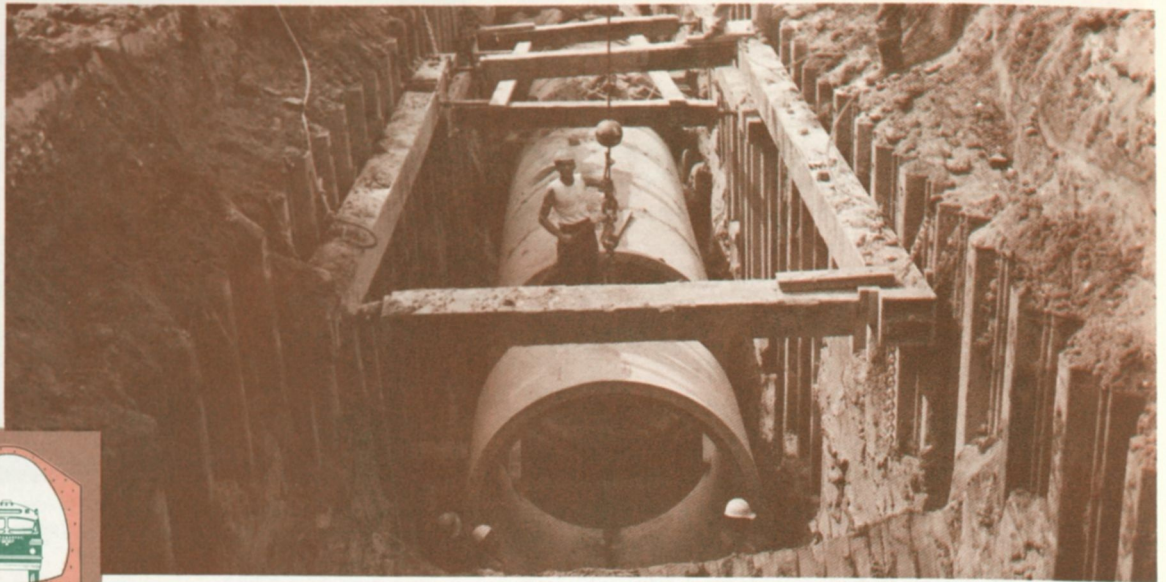
During the year, there were 1,027 new water accounts placed on the books, bringing to 509,297 the total number of accounts serviced by the Division. Total collections of \$55,751,192.91 were made by the Division, \$43,771,620.34 from metered-rate accounts, \$11,769,087.32 from assessed-rate accounts, \$68,647.10 from sewer rental accounts for properties outside the corporate limits of Chicago and \$141,838.15 from miscellaneous sources.

Field men made 1,180,683 visits to properties to read water meters, 79,113 to make assessments and resolve complaints and 67,376 to make collections of delinquent accounts.



The Collection Division serviced 509,297 accounts during the year.





A 90-inch diameter sewer section being set at Halsted Street and 49th Place.



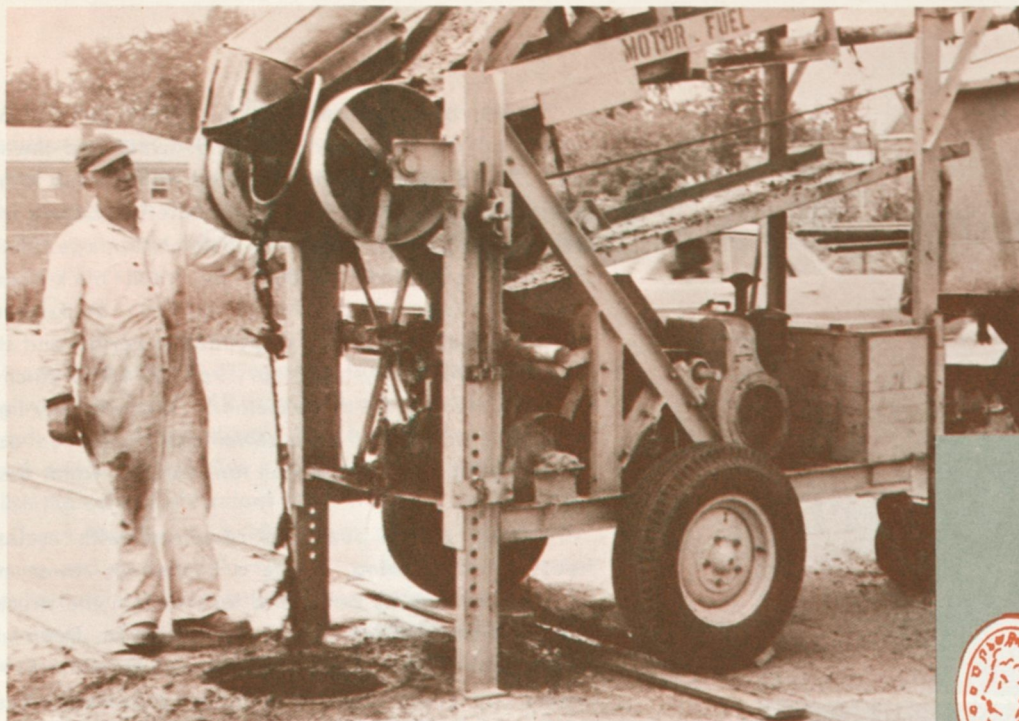
## sewers

Water supply and drainage presented only minor problems for the early settlers of Chicago since water was readily obtainable from shallow wells and natural drainage ditches drained the land to Lake Michigan or the Chicago River. However, as the population increased, seepage from privies and barnyards began to give the ground water supplying the wells an unpleasant taste. This condition forced them to use lake water, first brought in by carts, then pumped through pipes from intakes near the lake shore.

As the city grew, drainage ditches became a nuisance so they were covered over or replaced by wooden culverts; then by brick or tile sewers. These were extended as the land use was increased and more and more sewage poured into the river and the lake, creating an ever widening fringe of pollution along the lake front at the mouth of the river and at the sewer outfalls. Ultimately it was established that the germs carried in the sewage were the underlying cause of the periodic epidemics of cholera, typhoid and other water-borne diseases.

After extensive studies, a Water Supply and Drainage Commission appointed in 1886, recommended that a 28-mile drainage canal, now known as the Sanitary & Ship Canal, be built between the south branch of the Chicago River and Lockport. This recommendation was carried out by the Metropolitan Sanitary District of Greater Chicago, which was established by the State Legislature in 1889. Locks were built at the mouth of the Chicago River and the flow of the river was reversed to flow to the Des Plaines River at Lockport, thus removing a major source of pollution from the Lake. The City built sewers along the lake front to intercept city sewers which emptied





Bureau of Sewers' scraping machines removed debris from more than 6,500,000 feet of sewers during the year.

**\$259 MILLION  
ACTUAL COST**

**\$520.5 MILLION  
REPLACEMENT  
COST**



**DOLLAR VALUE OF  
CHICAGO SEWER SYSTEM  
TO DEC. 31, 1965**

into the lake, and the Sanitary District built intercepting sewers along the Chicago River to pick up the city sewers emptying into the river. Other canals, locks and special structures were constructed by the District to further protect the city water supply.

The Chicago Sewer System now consists of over 4,000 miles of sewers ranging in size from 10 inch diameter tile pipe to giant horseshoe-shaped reinforced concrete sewers 21.5' wide and 19.3' high. It is a "combined" system, that is, it accepts both water carrying sanitary and other wastes from homes and industries and storm-water from roofs, streets and paved areas. Normally only a small portion of the capacity of the sewers is utilized during periods of dry weather, and the flow is carried directly to the Sanitary District intercepting sewers and sewage treatment plants.

Sewers are designed with a grade or slope so that the flow is carried by gravity at a rate of about 3 feet per second which has been found to be a satisfactory "self-cleansing" velocity in the Chicago Sewer System. Despite this design some materials find their way into the sewers by way of the 143,420 manholes and 208,582 catch basins in the system which reduces the flow and eventually blocks the mains. Tree roots penetrating the joints of the sewer main, or a broken tile produce similar difficulties. Cleaning crews are called upon to remove these blockages and they have been equipped with a wide variety of modern sewer cleaning machines to do the work quickly and efficiently. Power driven rodding machines cut through rags and roots caught in the sewers and sewer scraping machines pulled buckets through the sewers to remove debris from 6,516,328 feet of sewer this year.





Special clam shell buckets helped in cleaning 274,913 catch basins in 1965.

Catch basins located at the street gutters collect water from the street surfaces, and divert it to the main sewer. These structures are provided with a sump to intercept gravel, dirt, sticks and other materials before it can enter the sewer and cause a possible stoppage. The basins are periodically cleaned by small truck-mounted hoists with special clam shell buckets; truck-mounted eductors which suck up the suspended materials and strain out the debris, or by hand. In 1965, 274,913 catch basins were cleaned by these methods. Occasionally lighter deposits which collect in a sewer can be flushed downstream by using a 2700 gallon tank truck or water flusher.

Heavy traffic pounding combined with cycles of freezing and thawing, create a continuous sewer maintenance problem as bricks are loosened in the structures and the frames which they support cave in. Deep utility excavations in the ground near some of the older existing sewers can cause them to collapse; especially some of the two-foot diameter single ring brick sewers. Failure begins when mortar joints are washed away and the soil or sand around the sewer pours inside. This leaves a void around the sewer which soon collapses. Repair crews use truck cranes, front end loaders, combination loader and backhoe, several heavy duty trucks, pumps of various capacities, air-compressors, portable lighting systems, and ventilating air blowers to make necessary repairs. In addition, new manholes and catch basins are constructed as needed. Crews repaired 2,017 manholes, 7,759 catch basins and 480 main sewer breaks in 1965.



The use of modern equipment expedites the sewer cleaning work of the Bureau.

Power driven rodding machines cut through rags, roots and other debris blocking sewers.





During the year 24,392 complaints were received from various sources. District crews, engineers or inspectors were assigned to check out and report on the disposition or correction of all such complaints. House drain and mason inspectors made 181,577 inspections of sewer construction work done by licensed contractors.

A system of Bench Monuments is maintained by the Bureau which includes 359 standard monuments, 35 sub-standard and 1,469 ordinary bench monuments. One-hundred and forty-six miles of precise levels were run to establish the correct elevations for 8 standard monuments, 82 ordinary benches and 104 street grades. Surveyors, engineers and contractors rely on the accuracy of these established points of elevation when constructing buildings, sewers, bridges and other structures which must match the elevations of existing improvements within close tolerances.

Over 27 miles of new sewers ranging in size to 12'x12', 1,269 new catch basins and 956 new manholes were added to the system in 1965.

## sewers

Crews repaired or rebuilt 2,017 manholes during the year.



Repairs were completed on 480 main sewer breaks during 1965.





The Department Training Program is divided into two major segments, operating personnel training and management and technical personnel training.

On-the-job training is the principal method used in the training of operating personnel. This training is supplemented by illustrated lectures and actual field demonstrations, particularly where new equipment or new methods are involved. In addition, operating personnel are sent to vocational schools, institutes and other schools to take operating engineer and water plant operator training. It also is to be noted that employees in the various crafts have completed their indentured apprenticeships where such programs are in effect.

A technical session at the Illinois Section, American Water Works Association annual meeting attended by Chicago Water System personnel.



Personnel are trained in the use of a special machine in the Billing and Accounting activities.



Management and technical personnel training consists principally of workshop and seminar sessions. Training in these sessions is accomplished principally by lecture, demonstration, discussion and a review of an accepted authoritative text on the subject of the session. This training is supplemented by sending selected personnel to professional society meetings, university extension courses and special college seminars. Top management of the Department regularly attends the Water Works Management Workshop, held twice a year, to meet with representatives of the larger water works systems in the United States in a two-day session to discuss water works problems of mutual interest and to reach solutions based on the broad experiences of the conferees. It is in these ways that management and technical personnel keep abreast of modern developments in the water works industry.

New employees are scheduled for the orientation training program and stenographers are enrolled in the secretarial training program, both conducted by the Civil Service Commission.

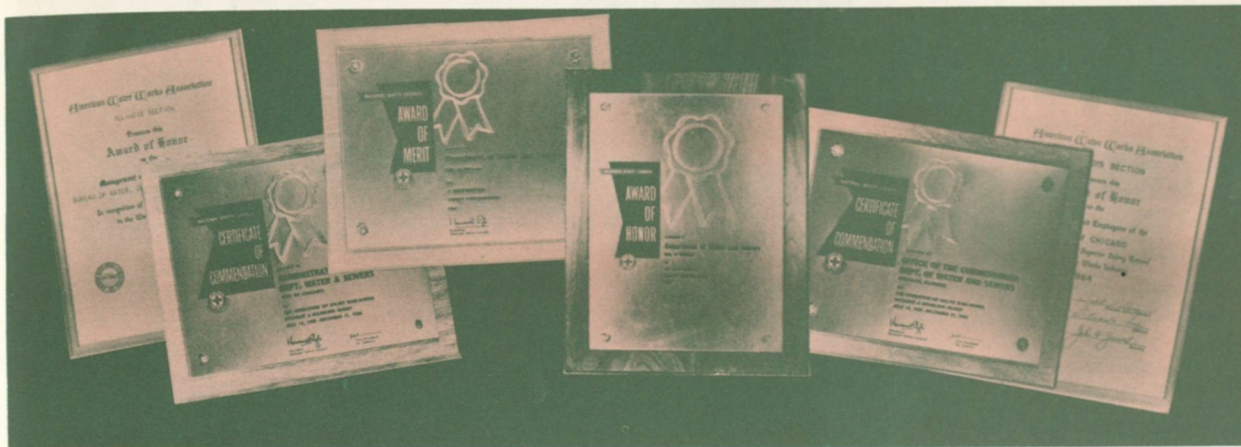
Studies are now being carried out to develop co-operative training programs with universities and colleges in the area to provide management, supervisory and other training courses for employees of the Department.

## in service training

Key engineering personnel attending a training session on operating procedures at Central District Filtration Plant.







The Department received the National Safety Council "Award of Merit" and the American Water Works Association "Award of Honor" for its safety record during 1965.

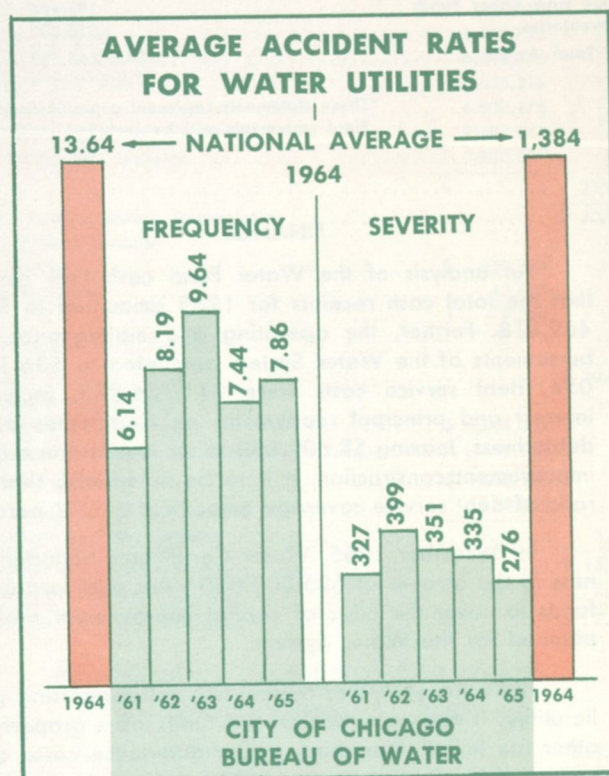
Chicago was one of the first large cities in the country to develop and put into effect in the operation of its Water and Sewer Systems a formal safety program designed to reduce employee injuries due to accidents and to protect the public from accidents that might result from work activities in the field. The intensive promotion of this comprehensive safety program has brought excellent results, a conclusion supported by the data in our 1965 Annual Accident Data Report which summarizes the accident experience during the year in all activities of the Department.

Safety committees and safety representatives in the various operating units of the Department are actively at work assisting the line supervisors in carrying out the rules governing safe work practices. The reporting of accidents is strictly enforced throughout the Department to make certain that all accidents are accurately reported and properly recorded. Safety Bulletins in which suggestions are made for avoiding accidents at work, at home and on the road are sent periodically to all employees in the Department.

The Department was given the National Safety Council "Award of Merit" and the American Water Works Association "Award of Honor," both in recognition of a noteworthy safety record during the year. The 1965 frequency rate for the Bureau of Water was 7.86 and the severity rate was 276. This compares very favorably with the data shown in the National Safety Council's bulletin, "Accident Rates" 1965 edition, in which the frequency rate for water utilities is reported at 13.64 and the severity rate at 1,384.

Lost time due to accidents cannot be recovered and thereby increases operating costs. The significant reduction in human pain and in lost time due to work accidents in departmental activities has more than compensated for the efforts expended in the intensive promotion of safe work practices.

## working safely



Engineer, protected by self-contained breathing apparatus, checks chlorine gas detector.





# FINANCIAL STATEMENTS\*

## WATER WORKS FUNDS

### BALANCE SHEET

December 31, 1965

#### ASSETS

<b>Fixed Assets:</b>	
Real Estate .....	\$ 1,935,226
Structures and Equipment .....	465,622,751
Less Reserve for Depreciation .....	71,355,136
Net Structures and Equipment .....	394,267,615
Work in Progress .....	14,376,150
Total Fixed Assets .....	\$410,578,991
Net Assets in Working Capital Funds .....	8,133,667
Cash for Repayment of Water	
Pipe Extension Certificates .....	154,449
Long Term Account Receivable .....	444,406
<b>Current Assets:</b>	
Cash with City Treasurer, Revenue Fund .....	3,696,779
Cash with City Treasurer, Certificates Fund .....	30,659,640
Petty Cash .....	18,150
Water Accounts Receivable .....	2,941,836
Other Accounts Receivable .....	31,402
Due from Other Funds .....	192,466
Inventories .....	1,013,802
Total Assets .....	\$457,865,588

#### LIABILITIES AND CITY EQUITY

City of Chicago Equity .....	\$269,264,786
<b>Long Term Liabilities:</b>	
Certificates of Indebtedness .....	\$182,000,000
Advances in Aid of Construction .....	121,854
Water Pipe Extension Certificates .....	154,449
Total Long Term Liabilities .....	\$182,276,303
<b>Current Liabilities:</b>	
Vouchers Payable from Revenue Fund .....	\$ 4,564,943
Vouchers Payable from Certificates Fund .....	490,763
Due Other Funds .....	15,675
Accrued Interest Payable on Long Term Debt .....	1,217,447
Other Current Liabilities .....	35,671
Total Current Liabilities .....	\$ 6,324,499
Total Liabilities and City Equity .....	\$457,865,588

\*These statements represent a preliminary financial summary of the water funds and are not final. Final statements will be included in the City Comptroller's Report for 1965.

#### FINANCE

An analysis of the Water Fund cash flow reveals that the total cash receipts for 1965 amounted to \$56,469,818. Further, the operating and maintenance disbursements of the Water System amounted to \$36,103,054, debt service costs were \$11,756,875, including interest and principal repayments on Certificates of Indebtedness, leaving \$8,609,889 to be invested in capital improvement construction. It is to be noted also that the ratio of debt service coverage amounted to 1.73 percent.

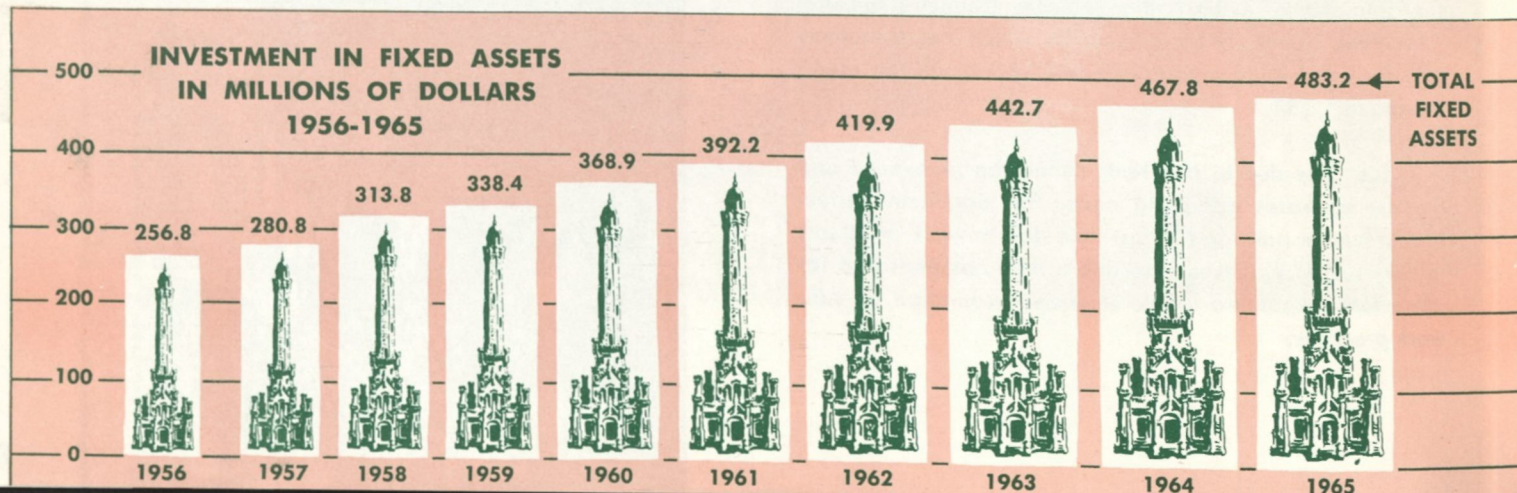
In December 1965, Water Certificates of Indebtedness in the amount of \$25,000,000 were sold to provide funds to cover the costs of capital improvement projects planned for the Water System.

The Chicago Water System is a self-supporting public utility. It does not receive any funds from property or other tax levies. Operating and maintenance costs, debt service and other costs are paid for from the revenues received from water charges.

#### CAPITAL IMPROVEMENTS — 1965

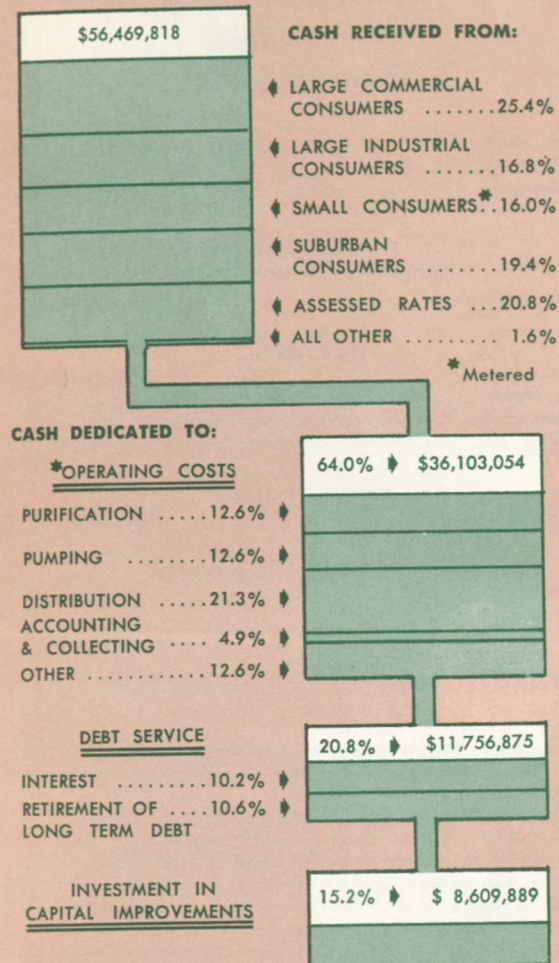
A total of \$15,771,780 was invested in the improvement and extension of plants and facilities of the Chicago Water System during 1965. Of this amount \$8,609,889 came from current revenues and the balance from Water Works System Certificates of Indebtedness. Included were \$5,057,666 for construction projects at the new Central District Filtration Plant, \$3,539,974 for construction projects to expand the South District Filtration Plant, \$4,907,029 for the construction of new water mains, \$1,432,385 for the construction of improvements in the pumping stations, including the construction of the new Lake View remotely-operated, electric station and \$196,634 for tunnel construction projects. In addition, \$638,092 was invested in the purchase of new equipment.

THE PRELIMINARY FIVE-YEAR CAPITAL IMPROVEMENT PROGRAM FOR THE CHICAGO WATER SYSTEM, 1966-1970, CALLS FOR THE INVESTMENT OF \$54,220,000.



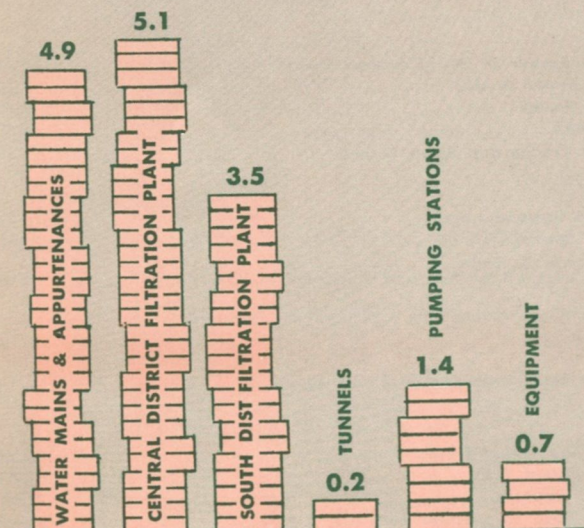


## SOURCE AND USE OF 1965 WATER FUNDS



\*ADMINISTRATIVE COSTS PRO-RATED TO DIRECT COST

## CAPITAL IMPROVEMENTS—1965 IN MILLIONS OF DOLLARS



## INCOME STATEMENT Year Ended December 31, 1965

<b>Operating Revenues:</b>	
Sales of Water .....	\$ 55,451,256
Other Operating Revenues .....	789,098
Operations of Working Capital Funds .....	(232,869)
<b>Total Operating Revenues .....</b>	<b>\$ 56,007,485</b>
<b>Operating Expenses Excluding Depreciation:</b>	
Source of Supply .....	\$ 306,010
Power and Pumping .....	6,476,713
Purification .....	6,512,956
Transmission and Distribution .....	10,655,312
Maintenance .....	6,607,275
Customer Accounting and Collecting .....	2,439,945
Administration and General .....	2,900,027
<b>Total .....</b>	<b>35,898,238</b>
<b>Operating Income Before Depreciation .....</b>	<b>\$ 20,109,247</b>
<b>Add Non-Operating Income:</b>	
Interest Earned .....	\$ 259,744
Rental of Real Estate .....	40,403
Other .....	9,244
<b>Total Non-Operating Income .....</b>	<b>309,391</b>
<b>Sub-Total .....</b>	<b>\$ 20,418,638</b>
<b>Less Non-Operating Expense:</b>	
Interest on Water Certificates .....	\$ 5,801,302
Less Interest Charged to Construction .....	449,182
<b>Net Interest Expense .....</b>	<b>\$ 5,352,120</b>
Other .....	22,358
<b>Total Non-Operating Expense .....</b>	<b>5,374,478</b>
<b>Net Income before Depreciation .....</b>	<b>\$ 15,044,160</b>
<b>Depreciation Expense .....</b>	<b>7,217,071</b>
<b>Net Income Carried to City Equity .....</b>	<b>\$ 7,827,089</b>


## STATEMENT OF CHANGE IN CITY EQUITY Year Ended December 31, 1965

City Equity January 1 .....	\$262,169,826
Add Net Income .....	7,827,089
Deduct Surplus Adjustment .....	(732,129)
<b>City Equity December 31 .....</b>	<b>\$269,264,786</b>



## DEPARTMENT OF WATER AND SEWERS

**JAMES W. JARDINE, Commissioner of Water and Sewers**



### BUREAU OF WATER

Raymond D. Johnsos .....Deputy Commissioner for Water  
H. H. Gerstein .....Chief Water Engineer  
Robert O. Waller .....Asst. Chief Water Engineer

#### PUMPING

J. L. Weeks .....Engineer of Water Pumping  
D. E. Kennedy .....Asst. Engineer of Water Pumping

#### PURIFICATION

O. Gullans .....Engineer of Water Purification  
J. C. Vaughn .....Asst. Engineer of Water Purification

#### DISTRIBUTION


J. T. Garrity .....General Superintendent  
T. F. Foley .....Asst. General Superintendent  
W. R. Lemm .....Engineer

#### METERING

J. J. Gilleran .....Acting Superintendent

#### COLLECTION

Edward A. Nihill .....Superintendent  
John J. Malone .....Asst. Superintendent



### BUREAU OF SEWERS

Edward A. Quigley .....Deputy Commissioner for Sewers  
Thomas E. Kilroe .....Asst. Deputy Commissioner for Sewers  
A. J. Schafmayer .....Chief Engineer

#### INSPECTION

Engineering — Mason — Plumbing

Edward W. Hallauer .....Assistant Chief Engineer

#### ENGINEERING

David Goldberg .....Assistant Chief Engineer  
Charles E. Benson .....Engineer of Sewer Construction and Maintenance  
Thomas Bresnahan .....Engineer of Sewer Construction and Maintenance  
Arthur Salkin .....Engineer of Sewer Construction and Maintenance

#### DISTRICT CLEANING

John L. Kilroe .....Superintendent

#### ARTERIAL REPAIR AND CLEANING

George White .....Superintendent

## ADMINISTRATION AND FUNCTIONS

The Commissioner of Water and Sewers is the chief executive officer of the Department. Each of the two component Bureaus, the Bureau of Water and the Bureau of Sewers, is headed by a Deputy Commissioner.

The Bureau of Water is responsible for the operation and maintenance of the Chicago Water System which furnishes a good quality, filtered water to all of Chicago and 63 suburbs. The Bureau is composed of five Divisions: (1) the Purification Division which operates and maintains the two largest water treatment plants in the world and monitors the water supply to insure its potability; (2) the Pumping Station Operation Division which operates and maintains four water intake cribs and ten pumping station; (3) the Water Distribution Division which operates and maintains the water distribution system and constructs additional water mains as needed; (4) the Meter Division which operates the meter repair shop, installs large meters, inspects and makes repairs of meters in the

field and maintains complete records on all meters, and (5) the Collection Division which reads meters in service and bills, collects and accounts for water charges.

The Bureau of Sewers operates and maintains the Chicago Public Sewer System which collects and transports sanitary and industrial wastes and surface water drainage to the interceptor sewers of the Metropolitan Sanitary District of Greater Chicago. The Bureau is composed of five Divisions: (1) the Engineering Division which plans and designs sewer extensions, betterments and major repairs; (2) the Cleaning Division which scrapes and flushes sewers and cleans catch basins on a district basis; (3) the Repair Division which makes repairs to the Sewer System on a district basis; (4) the Motor Fuel Tax Division which cleans and repairs City arterial highway sewers, and (5) the Inspection Division which supervises sewer construction, the installation of connections and the underground work of others done near public sewers to protect the sewers from damage.

## 1965 MAJOR SEWER STATISTICS



#### Existing Sewer System:

Miles of Sewer .....	4,007.31
Catch Basins .....	208,582
Manholes .....	143,420

#### 1965 New Sewer Construction:

Miles of Sewers—all sizes .....	27.16
Catch Basins .....	1,269
Manholes .....	956

Inspections .....	181,577
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Complaints Handled .....	24,392
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#### Repairs:

Total Number of Sewer System Repair Jobs .....	10,709
Main Sewer Breaks .....	480
Catch Basins .....	7,759
Manholes .....	2,017
Gutter Grates and Basin Outlets .....	453

#### Cleaning:

Sewers Scraped—Feet .....	6,516,328
Catch Basins Cleaned .....	274,913

Street Grades Established and Approved by City Council .....	104
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#### Standard Bench Monuments and Ordinary Benches

Established .....	90
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Standard Bench Monuments Constructed .....	0
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#### Receipts:

House Drain Permit Fees .....	\$ 124,560
Other Permit Fees .....	64,268
Special Deposits .....	91,880
Out-of-Town Connection Fees .....	68,647
Drain Layers' License Fees .....	39,450

Total Receipts .....	\$ 388,805
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# 1965 MAJOR WATER STATISTICS



## Population and Area Served

(Based on reliable estimates)

Population supplied:	
Chicago (1960 U.S. Census 3,550,404)	3,551,000
Suburban (Year-end census as revised)	1,041,000
Total	4,592,000

Area served (in square miles):

Chicago	227
Sixty-three suburbs	175
Total	402

## Per Capita Consumption

	Gallons Per Day
Chicago	240
Suburban	133
Average	216

## Chemical and Physical Qualities of Water

Total hardness (as parts per million Calcium Carbonate)	134
Water temperatures: Intake (Dever Crib)	
Average	48.5°F.
Maximum	73.0°F.
Minimum	32.0°F.

## Pumpage

	Gallons
Annual	
Chicago	311,178,000,000
Suburban communities and industries (metered)	50,381,000,000
Total*	361,559,000,000

\*(Amount through  
Western Ave. Reservoir...854,450,000)

Annual Metered Consumption  
in Chicago (50.4%† of Chicago pumpage) .....156,832,000,000  
†(Percentage of Revenue  
from Metered rates 78.8%)

Daily

Total daily average	990,570,000
Maximum day, July 23	1,502,330,000
Maximum hour (rate) July 23, 3:00 P.M.	1,861,000,000
Daily Average—Chicago	852,539,000
Daily Average—Suburban	138,031,000

## Purity Control

Laboratory tests made:

Bacteriological Laboratory	152,356
Chemical Laboratory	36,645
Microscopically for plankton	8,891
Electron Microscope	3,717
Control Laboratory S.D.F.P.	126,010
Control Laboratory C.D.F.P.	150,015
Total tests made	477,634

## Bacteriological Results

Annual average coliform organisms per 100 ml\*

	South District	North & Central District
Raw	45.8	142.
Plant outlet	0.003	0.010
Pumping stations	0.00	0.00
Distribution system	0.03	0.11

\*(U. S. Public Health Service Standard for safe  
drinking water permits a maximum average of  
1.0 coliform organisms per 100 ml)

## Purification Treatment

	Gallons
Complete Filtration Treatment	136,895,000,000
Filtration Treatment With Supplemental Chlorination	233,687,000,000

## Chemicals Applied—Tons

	Filtration Treatment SDFP	CDFP	Pumping Stations
Chlorine	1411	1811	412
Aluminum Sulfate (17% Al <sub>2</sub> O <sub>3</sub> )	5090	10,288	—
Activated Carbon	1547	1203	—
Lime	2300	445	—
Ferrous Sulfate (as FeSO <sub>4</sub> )	226	—	—
Anhydrous Ammonia	143	—	—
Sodium Silicate	35	—	—
Hydrofluosilicic Acid (23%)	2533	2810*	1317*
(As Fluorine)	461	510*	240*

\*Fluoridation Discontinued at Pumping Stations and started at CDFP on  
May 9, 1965.

## Supply

Crib intakes in service	2
Crib intakes on stand-by service	2
Emergency shore intake	2
Miles of water supply tunnels under lake and land (6 to 16 feet in diameter)	74.6

## Pumping

Pumping stations	10
Pumps available for service	50
Installed pumping capacity (Million gallons per day)	2890

## Annual Pumpage

	Million Gallons
By electrically driven pumps	145,468
By steam driven pumps	216,091
Total annual pumpage	361,559
Coal used by steam powered pumps (tons)	119,250
Electric power used by electrically powered pumps. (kilowatt hrs.)	71,623,900

## Distribution

Water Mains: (in miles)	
In use—December 31, 1965	4,083.01
Extended	19.41
Abandoned	9.69
Net addition to system	9.72
Diameter of pipe (inches)	4 to 60

Fire Hydrants:

In use—December 31, 1965	45,529
Installed	242
Abandoned	164
Net Increase	78

Gate Valves:

In use—December 31, 1965	42,040
Installed	491
Abandoned	221
Net Increase	270

Pressure range in mains (lbs. per square inch)	28 to 58
Average pressure at curb (lbs. per square inch)	37
Miles of pipe tested for underground leakage	2,142.83
Premises inspected—house to house leakage survey	57,516
Repaired main breaks—4 inch to 30 inch in diameter	179

## Meters

In service—December 31, 1965	161,341
Installed by master plumbers	1,392
Installed by Water Distribution Division	1,822
Total	3,214
Removed	2,227
Net Increase	987
Repaired on premises	18,474
Repaired in shops	16,010
Tested	17,731
Non-metered (assessed rate) services	347,956
Total Services (assessed & metered)	509,297

Supplements covering complete 1965 water  
or sewer statistics are available upon request.



UNIVERSITY OF ILLINOIS-URBANA



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DEPARTMENT OF WATER & SEWERS • CITY OF CHICAGO

